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CONTRACT ARRANGEMENTS IN THE FRUIT AND VEGETABLE SUBSECTOR IN SUB-SAHARAN AFRICA

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Abstract

Producers and marketing agents use a variety of formal and informal contractual arrangements in the fruit and vegetable subsector in Sub-Saharan Africa. Some of the more complicated forms of contracts exist for production that is exported to Europe. This paper summarizes the contract arrangements found in Ghana, Swaziland, The Gambia and Uganda. Low levels of asset specificity, uncertainty, access to financial services and information tend to be related with spot market mechanisms. Higher levels of each tend to lead to the use of completely vertically integrated arrangements. Other factors such as access to land markets are important in some cases in influencing the organization of production and marketing.

Contract Arrangements in the Fruit And Vegetable Subsector in Sub-Saharan Africa

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Producers and marketing agents use a variety of formal and informal contract arrangements in the production and marketing of fresh fruits and vegetables in Sub-Saharan Africa (SSA). Spot market transactions predominate in domestic trade. More complicated forms of contract arrangements exist for production destined for export to Europe. These include various types of vertical integration and other coordination methods designed to address the difficulties of penetrating the increasingly competitive foreign markets. Access to finance is also a consideration and often producers and exporters finance the trade by selling commodities on consignment.

Jaffee (1992) explained contract mechanisms ranging from spot market transactions to vertical integration based on various combinations of specialization of assets required for the trade (asset specificity) and the magnitude of uncertainty involved in trading the commodity. An important limitation of his framework when employed in developing countries is that it does not internalize the imperfections that often exist in financial markets. There is an increasing need to study the relationships between market coordination mechanisms and financial markets (Hart, 1988). Nagarajan and Meyer (1994) proposed a modified framework that recognizes the flow of commodities accompanied by a payment system that often involves deferred or advance payments. The modified framework extends the explanation of contract arrangements to include asset specificity and uncertainty as well as access to information and finance.

This paper examines the contractual arrangements observed in the fruit and vegetable subsector in Ghana, Swaziland, The Gambia and Uganda using the modified framework. These countries were included in the study because the US agency for International Development (USAID) was attempting to assess them to expand their nontraditional exports. Information gathered based on field research conducted in the four study countries during 1993-94 is used in the analysis. Interviews were also conducted with producers, marketing agents, exporters and importers in London, Paris and Amsterdam. The commodities emphasized were pineapples and Asian vegetables. The next section outlines the modified framework and is followed by a description of the various participants in the subsector. The description and explanation for the

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marketing and financial contract arrangements that facilitate the flow of commodities are then discussed. The implications for governments and donors conclude the paper.

I. Modified Framework

An important contribution of Jaffee (1992), following the transaction costs literature, was to develop a framework to study the contract arrangements used in the vegetable subsector in Kenya. He postulated that asset specificity and uncertainty in production and marketing of the product significantly affect the contract arrangements found in a subsector. He showed that the greater the degree of asset specificity and uncertainty, the greater will be the tendency for firms to vertically integrate their operations. The opposite was postulated for the existence of spot markets. Different combinations of asset specificity and uncertainty would lead to diverse types of short and long-term interlinked contracts between producers, marketing agents and/or exporters.

Empirical evidence, however, shows that access to financial markets is also observed to shape the arrangements found in a subsector ranging from spot markets to complete vertical integration of firms. In The Gambia, better access to finance facilitated the complete vertical integration of the fertilizer subsector (Nagarajan and Meyer, 1995). Studies also show that private commodity markets in Africa are generally competitive at the wholesale and retail levels despite weaknesses in transport, information, infrastructure, formal financial markets and law enforcement. But informal contract arrangements have been developed to mitigate financial and informational problems (Jaffee, 1992; Baydas and Meyer, 1993). Indeed, complex contractual arrangements observed in the African fresh fruit and vegetable subsector have enabled firms to compensate for deficiencies in the enabling environment by internalizing flows of information, finance and physical commodities to lower risks and economize on transaction costs (Jaffee, 1995). Economies of scale in processing/marketing facilities, strong technical, financial and managerial barriers to entry, market information, and the oligopolistic structure of world markets are observed to result in higher levels of market concentration with vertically integrated firms (Jaffee, 1992). The exporters of fresh tomatoes in Morocco that completely vertically integrated their operations due to their access to information and finance sold predictable quantities of tomatoes at 50 percent above the market price (Wilcock, et al., 1990).

These findings demonstrate that the imperfections of financial markets and the limited access to information that often exist in developing countries need to be incorporated into explanations about contract arrangements. Therefore, the modified framework extends Jaffee's framework by including financial market agents as participants in the subsector in addition to the producers and marketing agents of inputs and products. The modified framework also recognizes that informational flows lead to new forms of linkages and coordination among agents/firms to minimize transaction costs. Thus, the modified framework explains contracts based on the four factors of asset specificity uncertainty, and access to finance and information.

Several types of contract arrangements ranging from spot markets to vertically integrated operations are used to facilitate the smooth flow of commodities in a subsector. In *spot markets*, the participants are multiple independent firms that specialize in one or more stages of commodity flows and the transactions are usually consummated through immediate cash payments. In *complete vertical integration*, all assets at all stages from production to marketing are owned by a single firm that produces all the commodities marketed by it. In *quasi-vertical integration* (also called partial vertical integration), the products marketed by the focal firm are produced by both the firm and its contracted partners. Between spot markets and complete vertical integration lie several types of contractual arrangements including market specification, production management and resource providing contracts. *Market specification contracts* are formal but open contracts that are closer to spot markets in which a marketing firm promises a market outlet to its contracting partners without specifying the quantity to be purchased or the price. The firm also commits none of its resources to the production of the commodities. The marketing firm assumes the marketing risk and management, but transfers them to the producers at the production stage; assets are individually owned by the contracted producers. In *production management contracts*, the marketing firm has increased control over the production and management of contracted producers since it is concerned about the quality of the product. *Resource providing contracts* are closer to quasi vertical integration in which marketing firms provide market outlets and inputs for the production processes of their producer clients. The marketing firms have almost complete control over production decisions although the assets used in production are owned and operated by the producers. Contract farming arrangements generally use resource providing, production management and market specification contracts to establish linkages between producers and marketing agents and/or exporters.

The modified framework is utilized in table 1 to produce a matrix of several types of contract arrangements that may arise due to asset specificity, uncertainty and access to finance and information. It can be postulated that a combination of low levels of asset specificity, uncertainty, access to financial services and information tend to be related with open spot market mechanisms. On the other hand, high levels of idiosyncratic investments and uncertainties in production and marketing, and good access to finance and information would lead to the use of completely vertically integrated arrangements. Several types of contractual arrangements such as quasi vertical integration, resource providing, production management and market specification contracts will emerge between the spot and completely integrated markets to internalize the varying levels of asset specificity, uncertainty, access to finance and information so that transaction costs are minimized.

In the following sections, the participants in the subsector are first described and then the marketing and financial contract arrangements are discussed using the modified framework outlined above.

II. The Participants in the Fruit and Vegetable Subsector

(a) **Producers**: The majority of the produce sold in the domestic markets is grown by numerous small producers and a few large farms. Several small producers in peri-urban areas also function as outgrowers to large producers or exporters. The small producers usually serve the domestic markets through marketing agents, and indirectly the overseas markets through their contracted exporters. The large producers, however, concentrate on the overseas markets, and sell their export surplus/rejects in the intra- and inter-regional markets through marketing agents.

(b) **Consumers**: The intra- and inter-regional markets are the primary consumers of large volumes of low value horticultural produce grown in the study countries. A limited quantity is also consumed by domestic hotels and restaurants that cater to the local residents and tourists. The EU markets have become major overseas consumers in recent years through increased exports of: (i) Asian vegetables to ethnic markets, especially in the UK, (ii) high value products such as organic produce and asparagus to supermarkets, and (iii) roses to auction markets in Holland. The European demand for high quality products and reliable supplies have influenced the several contractual arrangements observed in the study countries.

(c) **Marketing agents**: Several wholesalers, retailers and commission agents function as market intermediaries to facilitate the smooth flow of commodities from producers to final consumers in inter- and intra-regional markets. While the marketing agents, especially wholesalers, frequently produce the products traded by them, the retailers and commission agents generally perform only marketing functions. These agents generally operate within established markets.

(d) **Exporters**: There are several exporters who actively trade with neighboring African countries but only a few export to overseas markets. The majority of the exporters tend to produce the products traded by them. However some producer-exporters also buy from contracted outgrowers and independent growers to increase their volume of exports. There also exist a few pure exporters who only purchase and export the products produced by contracted outgrowers and independent growers (see table 2, section II).

(e) **Agents providing support services**: This subsector also requires efficient functioning of markets requires efficient support services provided by governments, research and extension agents, financial markets, and agents involved in providing transportation, packaging facilities and market information. A constraint in these four study countries is that their governments currently play an insignificant role in providing the infrastructure required for the effective marketing of horticultural produce. Government research and extension support for production and marketing of horticultural produce is also negligible. Internal transportation facilities are poor. Although the majority of produce exported to the EU is air freighted, the airport facilities are poorly maintained and the lack of cold storage facilities at airports increases quality deterioration due to tarmac spoilage. In addition, air freight costs are high so several low value products such as Asian vegetables produces fairly low profit margins for the exporters. In addition, the airfreighters have a small capacity and are not consistent in their schedules. Furthermore, local facilities do not exist to produce quality packaging materials designed for exports so need to be imported from neighboring countries. For example, the packaging materials used in Uganda, The Gambia and Swaziland are imported from Kenya, Senegal and South Africa, respectively.

The several agents described above coordinate their marketing and financing activities through diverse types of contract arrangements as summarized in the next section.

III. Contract Arrangements for Marketing Fruits and Vegetables

The contract arrangements reported by the participants and presented in table 2, section III range from complete vertical integration to spot markets. The majority of the large commercial farms in Ghana and The Gambia performed several activities ranging from production to exporting rather than specializing in a single activity. In general, while some were completely vertically integrated, others were quasi vertically integrated. Several contract arrangements including resource providing, production management and market specification contracts were also used to procure commodities from outgrowers and independent growers. Diversity, however, exists even among participants producing/trading in almost the same commodities. In short, there is neither uniformity nor a clear pattern in the marketing arrangements used by the several agents operating in this subsector.

The marketing structure of the subsector in the study countries cannot be described by a single nomenclature. At the producer level, it is dualistic. On the one hand, there exist several small producers operating fragmented farms primarily servicing domestic spot markets and, to a lesser extent, the inter-regional markets through several marketing agents. Occasionally, some of these producers may also function as outgrowers to large producer-exporters/exporters. On the other hand, few large producers are engaged in exporting and have vertically integrated operations from production to exports. The level of integration may be of two types: (i) partial in the case of large producer-exporters who also buy from outgrowers to increase their volume of exports (for example, exporters of Asian vegetables in Ghana, The Gambia and Uganda), and (ii) complete in the case of large producer-exporters who produce all the produce they export (for example, the rose producing farms in Uganda). These large producer-exporters primarily serve overseas markets and only sell rejects in the inter- and intra-regional markets. At the market agent level, several competitive wholesalers, commission agents and retailers service inter- and intra-regional markets.

All transactions in the fruit and vegetable trade must be accompanied by a payment and financing system. The financial flows are summarized below.

IV. Contract Arrangements for Financing Fruits and Vegetable Subsector

Several financial sources ranging from formal banks to informal money lenders exist for financing the fruit and vegetable subsector. Despite the varied economic performance due to adjustments in macroeconomic policies among the case study countries, the mechanisms observed to finance the subsector are similar. The diverse sources of finance observed in the four case study countries are summarized in table 3. The financial arrangements found in the subsector can be characterized as follows:

(a) Self-finance is predominant in most firms. Funds are usually accumulated through retained earnings. Pure producers selling to domestic markets and exporters often participate in informal group activities such as Rotating Savings and Credit Associations (ROSCAs) to save and finance their businesses. Several of the large producer-exporters are, however, observed to be conglomerates involved in other businesses that cross-subsidize their horticultural production/export operations.

(b) On the one hand, informal finance through supplier's credit is frequently observed at all levels with finance flowing upward from producers to importers. On the other hand, as noticed in Uganda, a limited amount of buyer's credit is reported to be extended downward by exporters to their established outgrowers. Informal finance provided by friends and relatives and fellow traders is also commonly observed.

(c) Some NGOs in The Gambia, Ghana and Uganda provide grants and loans in a few cases to pure producers to acquire and prepare land and purchase inputs. But these financial services for fruit and vegetable producers are designed largely to create income generation activities and to improve the nutritional level of the households rather than to boost horticultural production for export.

(d) Joint ventures with foreign importers who provide capital and information to exporters are emerging to finance investments, working capital needs and marketing costs. Examples are found in Ghana and Uganda.

(e) Venture capital funds are limited to large size investments for commercial farms active in flower production. An example here is Uganda rose exporters.

(f) Off-shore banks provide services through the provision of letters of credit (L/Cs). The large producer-exporters with established overseas networks and offshore banking accounts can obtain letters of credit from these off-shore banks to finance their shipments to Europe.

(g) Formal finance from domestic banks in terms of direct loans is negligible at all levels. The majority of banks are located in urban areas and have few branches in rural areas. The share of agricultural loans in the total loan portfolio of commercial banks in the countries is insignificant, and the interest rates charged are very high compared to inflation rates and those charged by off-shore banks. The large producer-exporters and pure exporters can obtain conventional overdraft facilities to service some part of their short-term expenses and marketing costs. Nonetheless, these overdraft facilities are available only for established exporters.

The financial arrangements found in the fruit and vegetable subsector, in short, are relatively straight forward and uncomplicated: self-finance and informal finance through contractual arrangements predominate. The largest and most well established enterprises have some access to local and offshore banks to finance their production and exports to Europe. But, large producers and even medium sized operators, to a greater or lesser extent, act as creditors by selling their produce on consignment to their buyers in local and export markets. In effect, they offer supplier credit with terms from one to four weeks before receiving payment. Thus, the marketing and financial flows are highly intertwined.

V. Marketing and Financial Contract Arrangements: An Explanation

Several factors influence the observed intertwining of marketing and financial contract arrangements found in the subsector. These contractual arrangements can be explained through the modified framework outlined above. The predicted contract arrangements based on the modified framework and the observed contract arrangements in the study countries are presented in table 4. The analysis using selected crops shows the following:

(a) **Tomatoes and cabbages**: The observed spot market arrangement is correctly predicted by the modified framework.

(b) **Asian vegetables**: The modified framework predicts contractual arrangements such as resource providing contracts, production management contracts and market specification contracts. While the above arrangements are observed to a limited extent, quasi vertical integration is reported to be the predominant arrangement. However, the quasi vertically integrated firms that buy from outgrowers used market specification, production management and resource providing contracts to obtain the products.

(c) **Pineapples**: This scenario is similar to the case of Asian vegetables. While contractual arrangements such as resource providing contracts, production management contracts and market specification contracts are predicted to reduce transaction costs, we observe mostly complete and quasi vertically integrated firms. Nonetheless, the quasi vertically integrated firms used market specification and production management contracts to obtain products from their outgrowers.

The modified framework, based on asset specificity, uncertainty, and access to finance and information, predicts outgrower or contract farming arrangements wherein marketing agents/exporters rely more on production through contract farmers and less on their own farm production. However, we observe several quasi vertically integrated firms that primarily produce all the products marketed/exported by them and buy from outgrowers using contractual arrangements to only fill in for deficits. The slight divergence between the observed and the predicted contract arrangements can be attributed to several reasons.

In general, the use of outgrowers depends on the type of the produce, level of infrastructure and support facilities available, and ability of the contractors to screen and monitor the outgrowers and effectively enforce contracts. The necessary conditions for contract farming include the technical characteristics of the commodities. Crops that are highly perishable, labor intensive, require specialized inputs and technology, involve long gestation periods, exhibit economies of scale only in marketing and not in production and require less monitoring to ensure quality are suitable for contract farming (Little et al., 1994; Minot, 1986). Sufficient conditions for contract farming include conducive macro and micro environments for production and contract enforcement. Land tenure systems that do not provide leases of sufficient duration or security to safeguard tenant investments are not conducive to contract farming. Price controls and market regulations should be minimum, and access to finance and information should be good for the contractors so they can pass it on to their outgrowers. Also, access to good transportation facilities and communication should exist. Support from producers organizations that can lobby for producers' interests and vouch for product quality is also essential. Furthermore, if contracts are hardly enforceable, transaction costs involved in suing a small holder are high. Indeed, contract enforcement mechanisms increase the danger of souring relations with small farmers and makes it difficult to practice contract farming (Glover, 1984, 1990).

While the modified framework considers the necessary conditions and a few aspects of sufficient conditions, it assumes that the land and labor markets do not affect the contract arrangements. However, the unrestricted access to land in the Gambia and Ghana through long-term leases, and the fact that the majority of crops that are currently produced for exports require close monitoring to maintain quality has restricted the use of contract farming in these countries in addition to other factors outlined by the modified framework. Therefore, there are clear indications of a move towards complete/quasi vertically integrated large farms active in the production and exporting of fruits and vegetables. The preponderance of quasi vertically integrated firms can be attributed to four factors: (i) the presence of some economies of scope in the joint management of several activities and less economies of scale in specialization in just one activity such as production, (ii) the high costs in monitoring outgrowers for certain crops, (iii) the high barriers of access to finance and information to all but large farms. Better access to finance and information tend to offer a comparative advantage over the competitors, and (iv) access to long-term land leases to produce the crops. In contrast, the restricted access in Uganda to land for foreigners who are generally the primary participants in commercial production and marketing of fruits and vegetables combined with other factors outlined in the modified framework prompted the use of contract farming in the subsector. The welfare implications of the various types of contract arrangements are beyond the scope of this paper. For details on welfare implications of contract farming, refer to Grosh, 1994.

If the land market inefficiencies are also incorporated into the modified framework, we could have predicted the contract arrangements more accurately. The matrix presented in table 1 can then be expanded to include combinations of quasi vertical integration with other contract arrangements. Table 5 presents an extension of the modified framework that adequately explain the observed contract arrangements presented in column 8 of table 4.

VI. Conclusions and Policy Implications

Several contract arrangements are observed in the production and marketing of fruits and vegetables in Ghana, Swaziland, The Gambia and Uganda. This paper explains those contract arrangements using a modified framework that incorporates access to finance and information along with product characteristics that lead to asset specificity and uncertainty in production and marketing. A combination of low levels of asset specificity, uncertainty, access to financial services and information tend to be related with spot market mechanisms. On the other hand, high levels of asset specificity, uncertainties in production and marketing, and access to finance and information tend to lead to the use of completely vertically integrated arrangements. On the one hand, medium levels of asset specificity, uncertainty, access to finance and information combined with access to long-term land leases lead to quasi vertically integrated firms that use other contract arrangements to buy from outgrowers. On the other hand, the same circumstances combined with restricted access to land for commercial production lead to some contract farming arrangements. Our modified framework provides a plausible explanation for the observed contract arrangements, but its predictive power can be increased by incorporating land market inefficiencies. Nevertheless, the modified framework broadens our understanding of the observed contract arrangements, and points to several implications for donors and governments.

The inefficiencies of financial markets play a role along with product characteristics and land markets in shaping the contract arrangements found in the study countries. The risky nature of the subsector prohibits the active involvement of banks in financing the subsector without charging high interest rates. But major improvements in financial services for the subsector requires efficient mechanisms that reduce overall risks for horticultural production, marketing and exports. There are examples of innovative arrangements that augment commercial bank lending to the subsector. For example, the ECO bank in Ghana provides post-shipment loans to pineapple exporters to finance transportation costs. At the same time, the Bank of Baroda in Uganda effectively uses large producers-exporters as conduits and guarantees for loans extended to their outgrowers. These strategies should be carefully studied for possible replication.

It is important to streamline land tenancy arrangements. Long-term leases to producers, natives or foreigners, can be a viable option in order to increase the efficiency and equity in the subsector through quasi vertically integrated firms that have links with outgrowers.

Donors and governments can play a role in providing technical assistance and improving infrastructure facilities, and the collection and dissemination of market information. The example of Uganda can be cited here. Thanks to the creation of the Economic Policy and Development Unit (EPADU) with the assistance from USAID, attention is paid to documenting and analyzing the prospects of the horticultural subsector to serve alternate markets including overseas markets. The unit effectively provides short term training in the production and marketing of horticultural produce, and market information. In addition, it engages in the match making of prospective producer-exporters with importers, venture capitalists and foreign investors interested in joint ventures.

The appropriate role for the governments in these four countries is to provide an enabling environment in which contracts can be made and enforced, and to facilitate effective coordination and competition among agents. In the end, however, the agents must develop and use contracts that meet their respective needs and interests.

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Table 1. Factors Affecting Contract Arrangements: An Application of the Modified Framework.

Contractual arrangements	Asset Specificity	Production Uncertainty	Market Uncertainty	Access to Financial Markets	Access to Information
1. Complete vertical integration	High	High	High	High	High
2. Quasi vertical integration	High/Medium	High/Medium	High/Medium	High	High
3. Resource providing contract	Medium	Medium	Medium	Medium/High	Medium/High
4. Production management contract	Low/Medium	Medium	Medium	Medium/Low	Medium/Low
5. Market specification contract	Low	Medium	Medium	Medium/Low	Medium/Low
6. Spot markets	Low	Low	Low	Low	Low

Table 2. Marketing Arrangements Found in the Fruit and Vegetable Subsectors in Ghana, Swaziland, The Gambia and Uganda

	Countries			
	Ghana	Swaziland	The Gambia	Uganda
I. Crop Studied	Pineapple	Tomatoes/Cabbages	Asian vegetables	Asian vegetables
II. Types of Exporters				
a. Producer-Exporter with/without outgrowers	Common	Infrequent	Common	Common
b. Pure exporters with outgrowers	Infrequent	None	Infrequent	Infrequent
III. Marketing Arrangements Used for Exports				
a. Full vertical integration	Common	None	Common	Infrequent
b. Quasi vertical integration	Common	None	Common	Infrequent
c. Resource providing contracts to outgrowers (inputs and technology)	Infrequent	Infrequent	None	Common
d. Production management contracts to outgrowers (technology only)	Common	Infrequent	Infrequent	Infrequent
e. Market specification contracts to outgrowers (only market access)	Common	Common	Infrequent	Infrequent
f. Spot markets	None	Common	None	Infrequent

Source: Interviews conducted by The Ohio State University Research Team, 1993/94.

Table 3. Sources of Finance for the Fruit and Vegetable Subsector: Summary of Results from Ghana, Swaziland, The Gambia and Uganda.

Type of finance	Sources ranked by order of importance
A. Producers selling to domestic markets	
a. Investment	• Self finance • NGO grants
b. Working capital	• Self finance • Informal finance
B. Pure Producers selling to Exporters	
a. Investment	• Self finance • NGO grants
b. Working capital	• Self finance • Informal finance • Outgrower credit from exporters • NGO grants/loans
C. Large Producer-Exporter	
a. Investment	• Self finance (retained earnings from other businesses) • Informal finance • Joint ventures/partnerships • Venture capital • Domestic commercial bank loans • Government loans and subsidies
b. Working capital	• Self finance • Informal finance • Overdrafts from domestic commercial banks • Joint ventures/partnerships • Supplier's credit if buying from outgrowers
D. Pure Exporters buying from outgrowers/independent growers	
a. Investment	• Self finance • Informal finance
b. Working capital	• Self finance • Informal finance • Overdrafts from domestic commercial banks • Supplier's credit from outgrowers and independent growers
E. First or near first-time exporter	
a. Transportation costs	• Self-finance/informal finance • Deferred payments to airlines
b. Marketing costs	• Self-finance • Informal finance
F. Established exporter	
a. Transportation costs	• Self-finance • Imports • Deferred payments to airlines • Domestic commercial banks
b. Marketing costs (packaging to final sales to the importer	• Self-finance • Informal loans • Joint ventures/partnerships • Off-shore banks • Overdrafts from domestic commercial banks

Table. 4. Predicted and Observed Contract Arrangements in the Fruit and Vegetable Subsector in Ghana, Swaziland, The Gambia and Uganda

Country and crop	Asset Specificity	Production Uncertainty	Market Uncertainty	Access to Financial Markets	Access to information	Expected contractual arrangements	Observed contractual arrangements
1. Ghana: Pineapples	Medium	Medium	Medium	Low-Medium	Low-Medium	Production and market specification contracts	Complete and quasi vertical integration; Production and market specification contracts
2. Ghana: Asian vegetables	Medium	Medium	Medium	High-Medium	High-Medium	Resource providing contracts and quasi vertical integration	Quasi vertical integration; Production and market specification contracts
3. Swaziland: Tomatoes and cabbages	Low	Low	Low	Low	Low	Spot markets	Spot markets; Market specification contracts
4. The Gambia: Asian vegetables	Medium	Medium	Medium	Medium-Low	Medium-Low	Production and market specification contracts	Complete and quasi vertical integration; Production management and market specification contracts
5. Uganda: Asia vegetables	Medium	Medium	Medium	Medium-Low	Medium-Low	Production and market specification contracts	Quasi vertical integration; Resource providing contracts.

Source: Interviews conducted by The Ohio State University Research Team, 1993/94.

Table 5. Contract Arrangements: Predictions Using Extended Modified Subsector Framework

Contractual arrangements	Asset Specificity	Production Uncertainty	Market Uncertainty	Access to Formal Financial Markets	Access to Land Markets	Access to Information
1. Complete vertical integration	High	High	High	High	High	High
2. Quasi vertical integration	High/Med	High/Med	High/Med	High	Med	High
3. Resource providing contract	Med	Med	Med	Med/High	Low	Med/High
4. Production management contract	Low/Med	Med	Med	Med/Low	Low	Med/Low
5. Market specification contract	Low	Med	Med	Med/Low	Low	Med/Low
6. Spot markets	Low	Low	Low	Low	Low/Med	Low
7. Quasi vertical integration with resource providing contract	Med	Med	Med	Med/High	Low/Med	Med/High
8. Quasi vertical integration with production management contract	Med/Low	Med	Med	Med/High	Med	Med/High
9. Quasi vertical integration with market specification contract	Med/Low	Med/Low	Med	Med/High	Med	Med/High
10. Quasi vertical integration with spot markets	Med/Low	Med	Med/Low	Med/High	Med/High	Med/High